

REPORTS.

THE HOSPITAL SHIP "COMFORT."¹

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This ship, formerly the S. S. *Havana*, of the Ward Line, was commissioned as a hospital ship on March 18, 1918. The displacement of the ship is 10,000 tons; net tonnage 3,963; length over all 429 feet 10 inches; beam 50 feet 2 inches; draft when loaded 22 feet forward and 23 feet aft. The motive power consists of two triple-expansion engines of 10,000 horsepower. The maximum speed of the ship is 18 knots, and the coal consumption at this speed is about 175 tons per day. The economical speed is 14 knots at 100 tons of coal a day. The coal capacity of the ship is 1,060 tons in the permanent bunkers. Since coming into the naval service hold No. 2 has been used for a reserve supply. It holds 608 tons, giving a total capacity of 1,668 tons. The supply of coal at an economical speed in good weather conditions gives a steaming radius of 5,376 miles with a margin of 68 tons remaining. This radius of action is in practice materially reduced by head winds and seas, and on two west-bound trips it has been necessary to coal at the Azores in order to have a safe margin left.

The complement of the ship is as follows:

Medical officers.....	10
Pharmacists	2
Pay officers	1
Paymaster's clerk.....	1
Dental officer.....	1
Chaplain	1
Deck officers.....	6
Engineer officers.....	5
Total officers.....	27
Crew: Deck, engineer, and Hospital Corps.....	365
Total	392

Ten life boats are provided, calculated to hold 490 persons. In addition there are two ambulance boats holding 120 persons, one motor gig holding 27 persons, and life rafts sufficient to sustain 700 additional. These figures represent the maximum capacity of these

¹ Extract from Annual Sanitary Report, 1918.

boats and rafts and in all probability would be greatly reduced in actual emergency.

Normal capacity for patients is as follows:

Sick officers-----	14
Isolation wards-----	44
Surgical ward-----	56
Medical ward-----	36
General ward-----	142
Convalescent ward-----	28
Total normal capacity-----	320

The accommodation for patients in an emergency and for a short run of from 24 to 48 hours could easily be extended to 700 cases. As an ambulance ship for bringing home the wounded from abroad, 410 patients, of which 290 may be bedridden cases, can be carried by putting 50 cots in the solarium and additional cots in the convalescent ward, hospital corps quarters and the mess rooms on the promenade deck. It is always necessary to leave some place to accommodate the sick of the ship's complement and also to allow for the isolation of infectious cases which may develop during a trip.

At first sight it would appear that the normal capacity of this ship for the patients is small, but by comparing it with that of the *Drina*, of the British Navy, it is found that while the *Comfort* carries one patient for each 12 tons of the net tonnage, the *Drina* carries one for 38 tons, so it seems that the space has been comparatively well utilized.

The ship was commissioned March 18, 1918. She left the Navy Yard, New York, April 22, 1918, and reported to the commander in chief, Atlantic Fleet, Base 2, April 24, 1918, for duty in connection with the fleet.

On May 19, 1918, orders were received to proceed to the Navy Yard, New York, and fit out for special foreign duty. Arrived at the navy yard May 21, and on June 20, all necessary preparations having been made for distant service, the ship anchored off Staten Island, N. Y., awaiting orders. On July 24 the ship was assigned to the third naval district for temporary service, to take the overflow of patients from the U. S. Naval Hospital, New York.

On October 5, orders were received to prepare for distant service. Under these orders, all marks identifying the ship as a hospital ship were removed and it was given the status of a troopship.

On October 10 the medical officer commanding was relieved by a line officer, and the former was ordered to the ship as a passenger. The ship left the navy yard on October 21, and in convoy sailed for Brest, France, arriving at that port on November 3. On November 4, in accordance with orders, the writer resumed command and hoisted the Red Cross flag.

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The *Comfort* left Brest, France, on November 20 and arrived at St. Nazaire, France, on November 22, under orders to proceed to New York. Heavy seas and adverse winds were encountered, and it was found that the coal taken on board at Brest was of poor quality; so it was necessary to put in at the Azores for coal. The ship arrived at Ponta Delgada, Azores, November 27, where 11 additional patients were received, and left on November 29, arriving at Hoboken, N. J., on December 9, where the patients were disembarked.

On arrival at Hoboken orders were received assigning the *Comfort* temporarily to the transport force. While at Hoboken the ship was repainted as a hospital ship, in accordance with orders. The ship left Hoboken December 21 and arrived at Plymouth, England, on December 31.

During the period of this report, 1,269 cases were admitted or readmitted. Of these, 494 were discharged to duty, 28 died, 2 were invalided from the service, 699 transferred, 1 deserted, and 39 changes of diagnosis were made and readmitted; remaining, 3. The total number of sick days is 16,475. Seventy-seven surgical operations were performed. The dental treatments and operations numbered 1,536.

SHIP'S COMPLEMENT.

With the exception of the time this ship had the status of a troopship she has been commanded by a naval medical officer. Up to December 18, 1918, the officers other than those belonging to the medical corps, pay corps, dental corps, and the chaplain were in the status of naval auxiliary officers, and in most instances these officers were members of the Naval Reserve Force but placed on an inactive status while assigned to this ship. On the above date orders were received by the supervisor, Naval Auxiliary Reserve, at New York to change the status of all auxiliary officers on this ship to Naval Reserves, which was done, the master being given the rank of lieutenant commander and directed to report to the commanding officer for duty.

From the first, the members of the crew, other than those belonging to the hospital corps, consisted of regular service men and Naval Reserves. This combination of naval auxiliary officers with a naval crew was, from a disciplinary point of view, an undesirable mixture, as there was some evidence that certain members of the crew felt that "civilian officers," as they termed the auxiliary officers, had no authority over them.

The change of status of the auxiliary officers to that of Naval Reserves is a great improvement. Under the former status the officers felt a loss of prestige. There was, in the case of married men, a

loss of pay; and as the auxiliary service is maintained only for two hospital ships, there was little or no chance for promotion, with the ultimate result that hospital ships would lose their best officers.

ORGANIZATION.

Under the existing conditions, with the deck and engineer officers in the Naval Reserve service, the crew consisting of regular service men and Naval Reserves, there are no Naval Instructions or Regulations directly applicable to the administration of hospital ships.

The organization of the ship's company, the administration of discipline, and the assignment of responsibility has been in conformity with the spirit of the instructions relative to hospital ships with such naval regulations and instructions as may be applicable.

On the hospital ship the interests and duties of the medical department take precedence, except that the master must be unfettered in the discharge of his duty as relates to the navigation and safety of the ship.

It may be stated that the nonmedical part of the organization occupies on the hospital ship a position analogous to that of the medical department on a combatant vessel. In each case while occupying a subordinate position the navigator or medical officer is left free to carry out his specialized duties, and we have yet to hear of a line officer who would direct the medical officer how to operate or of a medical officer who would seek to instruct the navigator as to the measures to take in an emergency affecting the safety of the vessel.

The organization of this ship is regarded as consisting of two departments, a medical department and a nautical department. The former, directly under the executive surgeon, is divided into (1) hospital division, under the medical officer (nonspecializing), next in rank, having charge of the medical, surgical, and other activities directly concerned with the care and treatment of the sick and injured; (2) dental division; (3) medical supply division; (4) supply division; (5) record division, religious, recreational division (chaplain).

The nautical department is divided into the deck and engineer divisions, under the senior reserve officer acting as master.

It has been desired to avoid any tendency on the part of any one to feel that the organization is divided into two, but rather that, as stated, it consists of two departments with but a single duty—to relieve the sick and wounded. To promote a feeling of unity and to remove any possible imputation of a discrimination, the separate messes for the wardroom and for the deck and engineer officers have been amalgamated.

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The mess room on the boat deck, formerly used by the auxiliary officers' mess, should be converted into staterooms for deck officers, and the rooms vacated by these officers should be assigned to the junior engineer officers who now occupy uncomfortable rooms on the main deck among the enlisted personnel, which is somewhat detrimental to discipline.

The personnel and material records are kept by the medical department.

The liberty list, approved by the head of the deck and engineering divisions, is combined in the executive officer's office with that of the hospital division. There is always a deck officer (officer of the deck) and an officer of the day (medical) on watch, each doing duty in accordance with regulations as far as practicable on a hospital ship. Reports of offenses are brought by the heads of departments to the executive surgeon who investigates each case and if such action is required brings the man to mast.

During the year there were committed 170 minor offenses; 17 summary courts-martial and 39 deck courts have been awarded.

In the medical department the executive surgeon is assisted by the junior pharmacist who, in addition to being in charge of the medical supply division and of the special-diet kitchen, acts as a first lieutenant in making inspections and in the general upkeep of the spaces assigned to the medical department.

The medical officer immediately junior to the executive acts as a staff director, giving his attention to the supervision of the care of patients and of their health records in addition to his duty in his particular service. This officer keeps the executive and commanding officers constantly informed as to the condition of patients, their readiness for duty, recommends changes in diagnosis and medical surveys and serves to coordinate the work of the various members of the medical staff.

The supply division, under the paymaster, is conducted in accordance with regulations. Under the commissary the food has been served in an appetizing condition, the bread and pastry being particularly good. The ship's store is a great convenience to all hands.

The medical supply division is under a pharmacist. Issues have been made to ships urgently in need of certain supplies and to Naval Base Hospitals 1 and 5, to the U. S. Medical Supply Depot, Brest, France, and also to the naval medical officer at St. Nazaire.

The chaplain, in addition to his regular duties, has been active in securing musical instruments, a moving-picture machine, films, books, and periodicals, and has assisted the patients in communicating with their next of kin.

ADAPTABILITY OF THE SHIP FOR THE DUTY ASSIGNED.

It is desired to preface the following remarks by stating that it is recognized that an ideal hospital ship is with difficulty made out of one built for other purposes. In the case of the *Comfort* it may be said that the transformation has been very effectively done. This vessel is probably as good as any of her tonnage and, properly handled, is entirely seaworthy, as has been shown by her behavior in a succession of gales recently encountered. Built primarily for coast-wise trade, the construction, particularly of the deck house, is not as strong as in the regular trans-Atlantic steamers, and should be strengthened.

On the first trip to Europe some concern was felt over the four cargo ports, which open on the lower deck and are much of the time submerged. Being held in place by "dogs," and owing to the absence of three frames in each, these ports constituted weak points. The working of the doors was excessive, permitting a certain amount of leakage, which could not be stopped, as there was no way of calking these doors effectively. This defect was partially removed by building in the missing frames and riveting the doors to them. This, however, still leaves the projecting hinges, which are liable to be shorn off by craft coming alongside.

The deck house works considerably; much more, it is stated, than when the ship was in the merchant service. This is more noticeable forward where it is attributed to the heavy elevator and its equipment and particularly to the elevator motor which is placed above the chart house. Additional weights carried high up, such as lift rafts and boats, two large sterilizers, aft, and the equipment of the operating suite, forward, all have added extra weights to the deck house.

Between-decks space, which as a merchant ship was occupied by cargo, is now used for living spaces, representing little or no weight. To insure stability, extra water tanks, more bunker space (662 tons of coal), and additional ballast amounting in all to 550 tons has been added. This places the weights at the end of the vertical diameter and to it is probably attributable the increased working of the deck house. This condition shows the desirability, in planning a hospital ship, of avoiding the ever present inclination of building it up in the air and adding heavy weights on the upper decks.

A considerable saving of weight could have been effected by installing a less massive laundry chute than the present one which runs from the promenade deck to the laundry. The elevator could easily have been omitted and a hand lift or inclined plane substituted. An elevator about one-half the size would have been ample.

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Carrying the two ambulance boats forward on the hurricane deck has been found to be impracticable and these boats were left behind at New York when last in port. The position of these boats forward makes it impossible to maintain speed with a head sea without endangering the boats and possibly the water-tight integrity of the ship. It is understood that the *Mercy* on her first trip to Europe had one of these ambulance boats wrecked by a heavy sea coming over the bow. With the present arrangement of handling by means of booms, these boats would be of little or no service in abandoning ship in a seaway. The massive booms required to launch them have to be carried partially lowered and constitute a considerable menace to the safety of the ship. I have been informed by seafaring men that the marine underwriters would not permit a ship to go to sea with booms carried in such a manner. At least one of these ambulance boats is necessary, and it has been suggested that it be carried aft of the hurricane deck abreast of the medical ward.

All of the power boats are gasoline driven, consequently should the supply of gasoline fail the ship would be dependent on pulling boats. For this reason a small steamer to replace one of the gasoline-driven ambulance boats would be a desirable addition.

Ten hundred and sixty tons of coal are carried in the permanent bunkers, sufficient under ordinary weather conditions for 10 days' steaming at 14 knots, which equals 3,360 miles. A reserve supply of coal amounting to 608 tons is carried forward in No. 2 hold. This space is filled by dumping the coal through all decks in the vicinity of the forward convalescent ward, convalescent mess hall, crew's quarters and medical storeroom, which is extremely disadvantageous. The coal then has to be passed aft by hand a distance of about 50 feet to the wing passages above referred to. The closing in of the cargo hatches is recommended, being desirable for several reasons. First it would add to the water-tight integrity of the ship and to its structural strength. Upon the hurricane deck this hatch, at present, is secured by heavy timbers covered by a tarpaulin, which allows a certain amount of leakage below when seas are shipped over the bow. Secondly, by decking over this hatch on the main, lower, and orlop decks 1,200 square feet of deck space would be rendered available for some useful purpose, such as an increase in size of the forward convalescent ward, of the convalescent mess hall. This would provide for stowage space for deck gear and be useful in other ways.

The storeroom spaces are ample and, in general, well arranged. It is to be regretted that the medical stores are not placed aft and the general supplies forward instead of the reverse, as now obtains. All supplies from the after storerooms have to be removed through

the after convalescent ward, which is disturbing to the patients, tends to keep the ward in an untidy condition, and subjects the crew to contact with the patients. The supplies handled by the pay officer have to be drawn daily, while access to the medical storerooms is infrequent.

Access to the deck from the living space for the engineer's force is through the after convalescent ward and there is no other route available. It is recommended that the ladders from this space to the hurricane deck be inclosed by diamond-mesh partitions with a door which can be opened from the ward side, the latter being desirable in case of emergency when it is necessary to evacuate the ward quickly. This arrangement, while permitting the ward to utilize these hatches for ventilation, would prevent the use of the ward as a passage for men going on and coming off duty.

The hurricane deck outside of the deck house, as well as in the crew's space and after convalescent ward have numerous cargo hatches with high coamings, which materially reduce the available floor area. As these hatches serve no useful purpose, it is recommended that they be removed, leaving openings for ladders and ordinary supplies. This would allow considerably more room for bunks for the sick or for other purposes.

The location of the insane and brig cells is inconvenient, in that they are accessible only by means of doors through a water-tight bulkhead, which should not be opened at sea, and in the case of accident involving the hull, might render it impossible to release the occupants of the cells. The construction of the cells is very light, as was demonstrated recently when an intoxicated man was confined. He not only broke out of one cell, but into another. These cells will have to be strengthened, and when this is done they should be made accessible from the space abaft of the water-tight bulkhead. It is believed, however, that except for the occasional use of these cells as a punitive measure, there is little need for them. As a matter of fact but few insane patients require solitary confinement and in most cases it is undesirable. If violent they are much better controlled with hot water baths and sedatives. What is required is that a small ward, such as the forward convalescent ward or a portion of it, be prepared for the insane by means of diamond-mesh partitions and doors, for most of the mental cases simply need sufficient restraint to prevent them from wandering about the ship, with the possibility of doing damage to it or themselves.

The laundry occupies a position which is well adapted for ward purposes. The laundry could be placed on the lower deck immediately below its present situation, in which case it would be necessary to make some provision for drainage other than into the bilges. This could be accomplished by means of a tank and a motor-driven

pump to carry the wash water overboard. The space now occupied by the laundry could be assigned for ward space, which would add approximately 30 bunks. As the after convalescent ward now has 142 bunks, to add 30 additional would make it rather unwieldy, so it would be better to divide this entire space into two wards of about 86 beds each, installing additional toilets and lavatories in the after part of the space now occupied by the laundry where there is now a single water-closet.

The facilities for handling patients in stretchers from boats and from one deck to another are very poor; in fact, the use of the Army stretcher in which the Army sick are received is impracticable, requiring transfer to the Navy wire stretcher. While the gangway ladders are broad and easy of ascent, the passageways abreast of them are too narrow for a stretcher to turn in conveniently. The ladders should be placed so that the upper platform is abreast of the lobby, which, aside from being the station of the officer of the day and officer of the deck, is the most convenient place from which to distribute patients to the wards. The surgical ward is near by and the elevator can be utilized to transfer stretcher cases to wards on the promenade deck; in fact, this is the only way in which patients can be transferred to the promenade deck without great discomfort and inconvenience. When alongside a dock and tidal conditions permitting, the patients may be passed directly into the after convalescent ward through a cargo port; otherwise it is necessary to carry them by hand down the ladders or by the stairway amidship just forward of the wardroom space.

The fore and aft passageways inside the deck houses on the hurricane deck are too narrow to allow the passage of an Army stretcher, and barely permit the use of a Navy wire stretcher; but, by having removable rails replace the present fixed wooden rails to the stairway, it would be possible to carry the patients down the stairway in the splint stretcher. There is no special contrivance for handling patients in boats at sea as was installed on the *Solace*, nor is it known how practical this arrangement has proved. If required, cargo booms or boat davits could be utilized for this purpose.

The toilet facilities are generally adequate and satisfactory except in the two convalescent wards. If the proposed changes are made in utilizing the space now occupied by the laundry and the installation of toilets, the situation in the after ward would be relieved. The forward convalescent ward of 28 beds has to share toilets and water-closets with 105 hospital corpsmen, and the facilities are insufficient.

From practical experience it is believed that the bathtubs aboard this ship are undesirable. A tub requires space sufficient for three shower baths, and uses at least 10 times the fresh water, and serves

comparatively few men in a given time. Tubs are difficult to keep clean, and the shower is preferred by most men. It would be well to reserve one or two tubs for mental and other cases. If a patient is too weak to take a shower bath he is given a sponge bath. No matter how liberal the output of distillers may be there is always on board a cruising hospital ship the necessity for a reasonable economy in the use of fresh water. All fresh water faucets, with the exception of certain ones, as about the galley, scullery, and laundry, should be of a compression type.

The white tiling in various lavatories, galley, and pantries is very effective from an esthetic point of view. It is certainly conducive to cleanliness, but in parts of the ship where there is much working, as in the deck house, these tiles are already rapidly becoming loosened and falling out. The use of sheet zinc and white enamel paint for the walls appears to be preferable and certainly very much less expensive. Tiled floors in the galley and pantries are undesirable. When the ship is rolling and pitching, it is impossible to keep these floors free from grease, particles of food, and soapy water which render them so slippery as to be hazardous. At times during heavy weather it has become necessary to stretch lines across the galley to prevent the cooks from being thrown across the range and to permit them to get about. Concrete or brick flooring would be much better.

SERVICE PERFORMED.

The service of this vessel has been one of comparative inaction, alternating with periods of marked activity under adverse conditions. While assigned temporarily to the third naval district the ship served to relieve the congestion of patients at the United States Naval Hospital, New York. During the epidemic of influenza 262 cases were admitted. Of these 24 died, giving a mortality rate of over 9 per cent. The course of the disease was similar to that reported elsewhere. Prior to receipt of the first case, screens had been prepared separating contiguous bunks. When the patients came aboard the cases were treated as highly contagious. The attendants were required to wear gauze masks, coats, and gowns and the hands were required to be sterilized after handling patients. The hospital corpsmen and the crew were instructed in the prevention of infection. It is of interest to note that, although liberty was given, very few of the ship's company contracted the disease. There were no deaths or serious cases among them. It is particularly worthy of note that there was almost no evidence of the transmission of the disease to those directly in attendance upon the sick.

With the assignment of this ship to trans-Atlantic service to bring home the sick and wounded abroad, its duty as a hospital ship has

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been succeeded by that of an ambulance ship. As such, with its complete equipment and large medical staff, it is clearly the function of this ship to carry the most seriously injured who require frequent and expert surgical attention. With this point in view, every effort has been made to impress upon the embarkation officers that the 300 bunks available for serious cases should not be utilized to carry patients who could equally well be carried by the regular transports, and from this number, up to 400 should be ambulant cases capable of climbing ladders and going to the mess room. It has been found difficult to convince some of the Army officials that the term ambulant with reference to a ship and the ability to climb ladders is not applicable to one-legged men, of which class some 50 were sent to the ship at St. Nazaire who had to be assigned to accommodations intended for strictly bed-ridden patients.

The majority of the cases received on this trip were such as could not have been properly attended to with the facilities usually afforded on transports. In order to take 400 patients, cots were placed in the solarium, forward convalescent ward and hospital corps quarters.

The patients (Army wounded) were brought to St. Nazaire from base hospital No. 8, at Savenay, by ambulance train, from which they were transferred to the ship in ambulances. The embarkation up to the gangway was by the Army embarkation officer and was well conducted.

In order to avoid confusion, through assigning patients to the wrong ward or to overfilling any one ward, and to be able to quickly locate any patient, the following system was inaugurated. A Dennison tag was prepared, having the ward letter and bunk or cot number entered on it in duplicate. These tags corresponded to the number of accommodations available. A medical officer was stationed at the gangway to make an assignment for each patient. The patient's name was checked off on the list furnished by the embarkation officer and was entered on the lower part of the tag designating his billet. This lower portion was then detached for the record office and files and the remaining portion was attached to the patient. In this way it was impossible for a patient to get lost by being sent to the wrong ward and there was no possibility of any one ward receiving more patients than there were billets. In the record office, the files were then arranged to show the patients' names alphabetically.

It is important in placing patients in bunks which are accessible on one side only that the cases be assigned so that the injured part will be most accessible and at the same time it is desirable to alternate the head and feet in reference to the near neighbors in the same level as well as those above and below.

The necessity for taking every precaution against droplet infection was shown by an outbreak of diphtheria in three widely separated wards within two days after embarkation. Contacts were immediately isolated and the personnel of the infected wards were cultured for diphtheria. In all, 12 positive cultures were discovered, of which 10 were clinically diphtheria. The death of 1 patient, found to have nasal involvement, occurred in spite of the use of antitoxin in large amount. There was practically no spread of the disease after the primary outbreak. Upon inquiry some of the patients stated that several patients who were suffering from "throat trouble" had been removed from beds adjacent to their own in the base hospital.

Among the most seriously injured were 50 cases of gunshot fracture of the femur. Extension was maintained by the Thomas splint and where indicated the Carrell-Dakin treatment was carried out. Over 350 daily dressings were made. Dichloramine-T was used to a considerable extent and with very satisfactory results. In spite of the excessive motion of the ship the fracture cases suffered no serious inconvenience and were disembarked markedly improved.

No radical procedures were carried out, such as the removal of the dead bone, or fixation of bones because of the unfavorable weather conditions for operative work and the comparatively short time that the patients were to be aboard.

On the second trip over, to Plymouth, England, the ship received 95 Navy cases and 238 Army wounded, a total of 333, which is 67 under the number desirable to take. Of these cases about one-half were in such a condition as to have been able to travel via transport.

It is understood that at this time practically all of the serious cases had been evacuated from the English hospitals.